The Dissertation Committee for Jeannie Marie Aguilar certifies that this is the approved version of the following dissertation:

Preference for Language of Instruction for Students with Developmental Disabilities Who Come From Spanish-Speaking Families

Committee:

Mark F. O'Reilly, Supervisor

Terry S. Falcomata

Nina I. Zuna

Diane P. Bryant

Catharine H. Echols

Preference for Language of Instruction for Students With Developmental Disabilities Who Come From Spanish-Speaking Families

by

Jeannie Marie Aguilar, B.A.; M.Ed

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Dedication

For my lovely sisters: Diana, April, and Desirae

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Preference for Language of Instruction for Students With Developmental Disabilities Who Come From Spanish-Speaking Families

Jeannie Marie Aguilar, Ph.D.

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Supervisor: Mark F. O'Reilly

Preference evaluations have been used to determine children's preferences, for reinforcers, consequences and even preferred instructional strategies. English Language Learners (ELLs) with developmental disabilities (DD) are a quickly growing population and the application of these assessments may be useful in determining preference for language of instruction. This dissertation includes two studies with the purpose of determining whether preference assessments could be used to establish a preference for language of instruction in children with DD who come from Spanish speaking homes. In the first study, a concurrent chains method was used to evaluate a child's preference for English vs. Spanish instruction. Three colored (blue, green, and yellow) micro switches were used to represent English instruction, Spanish instruction and control (no language) followed by a preferred reinforcer after instruction. Exposure trials were used to teach the chains for each micro switch. Choice sessions were then implemented. All three switches were placed in front of the child and the child was allowed to choose a switch which then initiated the chain associated with that particular switch. After the 10th session switches

were reprogrammed to prevent a bias for a specific color and preference procedures were then rerun to see if the preference for language remained. Results from the assessment showed that the child chose Spanish instruction most often. He continued to choose Spanish instruction after switches were reprogrammed. In study two, an ABAB design was utilized to assess the effects of task difficulty on preference for language of instruction. Five children with DD participated in home or school settings. The concurrent chains assessment from the first study was utilized as the preference assessment. Tasks included mastered task (easy) and non-mastered tasks (difficult) from the children's IEPs. Results for study two indicated that task difficulty had an effect on the preference for language of instruction. Four out of five of the children showed no clear preference for language of instruction when tasks were easy, however they showed a distinct preference for language of instruction when tasks were difficult. Discussion on results of the studies, implications for practice in working with ELLs with DD, and directions for future research are presented.

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Chapter 1

Introduction

The population of English Language Learners (ELLs), in the United States is rapidly increasing (Census, 2013). ELLs with developmental disabilities (DD) need to be served with best practices which includes preference assessments (Tullis et al., 2011). Most commonly preference assessments are used to identify items to be used as reinforcers for skill acquisition targets. Increasingly, studies have investigated the effects of preference on instructional aspects such as: task engagement, teaching strategies, materials used, treatment packages, and challenging behavior during skill acquisition. Preference for language variables could be measured using similar methodologies. This dissertation will explore the use of preference assessments for language variables.

According to the US census, the Hispanic population in America is burgeoning. The last census reported 52 million people of Hispanic origin, and that population is expected to reach 30% of the US population by the year 2050 (Census, 2010). This has led to a large number of English Language Learners (ELLs) or those whose native language is not English in the United States. Shin and Kominski (2010) estimated that nearly 20% of the US population age 5 years and older speak a language other than English at home.

This population increase is also reflected in the school systems enrollment. The National Center for Education Statistics reported that ELLs comprised 10% of the public school enrollment (National Center for Education Statistics, 2013).

Schools are faced with the task of providing a quality education to students whose native language is not English. Recommendations for schools and professionals are provided in a policy brief by Flynn and Hill (2005). Their recommendations for working with ELLs included ensuring that the staff are aware of the laws regarding serving ELL populations, supporting instructional efforts by teachers working with ELLs, and creating environments that are accepting of diversity. They also recommended that schools monitor and evaluate ELL programs. Instructional advice calls for using the primary language when possible, attempting to transfer existing native language skills to English language acquisition, and becoming familiar with the student's history and culture. Recommendations and research are not limited to only the typically developing population. Research has also focused strongly on students in special education.

ELLs in Special Education

As numbers of ELLs grow, we would expect to also see increased numbers of ELLs in special education. Indeed, increasing numbers of ELLs have been a concern over the past few years as the field of education considers how to best serve these students. Some research has focused on accurately identifying students who belong in special education from students whose lower performance in school may be due to the challenges associated with acquiring a second language (Artiles, Rueda, Salazar, & Higareda 2005; Ortiz &Wilkinson, 2006). Research in this area has focused on examining disproportionality of ELLs in special education and determining more stringent evaluation processes for placing students into special education.

Other research has focused on instruction of ELLs who are in special education; however, this has pertained mainly to students with learning disabilities (McCardle, Mele-McCarthy, & Leos, 2005). This research has focused on the best instructional and assessment approaches for students who have reading, writing, and math disabilities. One area of special education that continues to need research to guide best practice is the area of developmental disabilities.

ELLs with Developmental Disabilities

While research on ELLs with learning disabilities is certainly needed to inform the field of how to best serve this population, research on ELLs with developmental disabilities (DD) is also needed. Boyle et al., (2011) reported that nearly 1 in 6 children in the United States has a developmental disability. This number is higher than the numbers of children diagnosed with attention-deficit/ hyperactivity disorder and learning disabilities. Students with DD, such as intellectual disabilities (ID), Down syndrome (DS), and autism spectrum disorders (ASD), typically have difficulty with communication and skill acquisition. Some students with DD may never develop language or may be severely delayed in language areas (CDC, 2013). This difficulty is compounded when we consider students with DD who are also ELLs. Additionally, it may be difficult to assess the language skills of children with developmental disabilities due to their limited attention spans and challenging behaviors. The complexity of assessing these students often leaves educators perplexed as to how to meet ELLs' disability-related and language-related needs simultaneously. One of the most important,

and least understood issues, is how to choose the language of instruction for ELLs with severe disabilities and limited language skills. This study addresses this gap in the literature by focusing on language preference assessments for ELLs from homes where Spanish is the primary language spoken.

Preference Assessments for Instructional Variables

Preference and choice assessments provide systematic ways of determining client's wants and desires. This is particularly important for individuals with disabilities, since deficits in communication skills may make it difficult for them to vocalize their opinions. Previous reviews of preference and choice studies have found that identifying individuals' preferences and giving individuals choices can lead to the use of more effective reinforcers. This can improve instructional contexts by decreasing challenging behaviors, increasing attention to task, and increasing correct responding on tasks (Canella, O'Reilly, & Lancioni, 2005; Lancioni, Singh, O'Reilly ,1996; Tullis et al., 2011). The use of preference assessment to determine clients' choices in other aspects of treatment such as choice of work task order (Cole and Levinson, 2002; Moes, 2002), choice of treatment type (Hanley, Piazza, Fisher, Contrucci & Maglieri, 1997), and choice of communication devices(Van der Meer, Sigafoos, O'Reilly, Lancioni, 2011) has also increased.

A synthesis of studies looking at preference for treatment variables has yet to be conducted and may be helpful to develop clear systematic methodologies and aspects for the utility of these types of preference assessments. The utilization of preference for instructional variables could help guide the field towards treatments that are not only

effective, but accepted by those for whom the interventions were created. This may be one way of providing a voice to those individuals with disabilities who are the direct consumers of the interventions

PURPOSE

The purpose of this dissertation is to add to the research on preference evaluation for instructional variables in individuals with DD. More specifically, this dissertation will focus on establishing a methodology to assess the preference for language of instruction in students with developmental disabilities who come from Spanish speaking homes. The final study will evaluate the effects of task difficulty on preference for language of instruction in students with DD.

Chapter 2 provides a literature review on the utilization of preference evaluations for instructional variables in individuals with DD.

Chapter 3 provides the methodology for the two studies presented in this dissertation. Study 1 focuses on procedures for assessing language preference in students with developmental disabilities who come from Spanish-speaking homes. The research question addressed in Study 1 is as follows:

Can preference assessments be used to determine a preference for language of instruction in children with DD who come from Spanish speaking homes?

Study 2 looks at the effects of the difficulty of task on the language preference. Specifically it looks at the effects of easy tasks versus difficult tasks on the preference for language of instruction. Study 2 asks the following research question:

Do children with DD change their preference for language of instruction when they are given difficult tasks versus easy tasks?

Chapter 4 will discuss the results from Studies 1 and 2, followed by Chapter 5, which will provide a discussion of the studies and suggestions for future research.

Chapter 2: Choice and Preference for Treatment Variables in Individuals with Autism and Developmental Disabilities: A Systematic Review of the Literature

This chapter provides a literature review on previously published articles addressing preference for treatment variables in individuals with developmental disabilities. A systematic search of articles was conducted and the methodology for the search is provided. Articles that met inclusion criteria were coded and analyzed for relevant variables relating to the evaluation of treatment preference. Results of the search are provided, followed by a discussion of the articles and future directions for research.

The purpose of this review is to provide some evaluations on the following questions:

1. Who is given choice/preference within their treatments (participant characteristics)?

2. What types of preferences are evaluated (beyond typical preference assessments for determining reinforcers)?

3. How are choice and preference evaluated, (i.e., what methodologies are utilized to determine choice and preference?)

4. Are the methodologies effective in determining a clear preference for this population?

SEARCH PROCEDURES

Systematic searches of Education Resources Information Center (ERIC) and PsychINFO were conducted using the keywords “choice” or “preference,” in the first key term field, and “disabilit*,” “ autism,” “ mental retardation,” “ intellectual disabilit*,”

"moderate disabilit*," "severe disabilit*," and "developmental disabilit*,"in the second key term field. The resulting abstracts were found and reviewed to identify articles for inclusion. In addition, reference lists of articles meeting criteria for inclusion were reviewed for any additional articles that were not found in the database search.

Inclusion and Exclusion Criteria

To be included, articles had to meet the following inclusion criteria:

1. Conduct a preference evaluation. An evaluation of preference must include a participant's explicit choice for the variable of interest. Preferences inferred by a participant's other behaviors (e.g., rates of challenging behaviors, rate of skill acquisition, or level of prompting needed) were not included (e.g., Newman, Needelman, Reinecke, & Robek, 2002).

2. Evaluate preference for some aspect of treatment other than a potential reinforcer or leisure items/activities. Articles that included a preference assessment for the purpose of establishing items or activities for potential reinforcers were not included (e.g. Ciccone, Graff, & Ahearn, 2007).

3. Include students with developmental disabilities, including mental retardation (MR) or intellectual disability (ID), Down syndrome (DS), and autism spectrum disorders (ASD) and any other cognitive developmental disability. Participants with comorbid disorders were included.

4. Provide a description of how the evaluation was conducted.

5. Present data on the participants' choices as a dependent measure of the preference evaluation.

6. Be published between the ten year span of 2002 and 2012

7. Be published in English language peer reviewed journals

Data Extraction

After applying the inclusion criteria, each included article was read in its entirety, and data pertaining to the preference evaluation was coded for the following information (a) participant characteristics, (b) preference comparisons, (c) type of preference assessment utilized, (d) how preference was determined (i.e. response definitions), and (e) results of the preference evaluations.

Results

A total of 23 articles met inclusion criteria. Table 1 summarizes the (a) participant characteristics (N, gender, age range, and diagnosis), (b) preference comparisons (c) preference assessment type, (d) response definitions, and (e) results of the preferences assessment. Results of the preference assessment were coded as *positive* if the evaluation was able to determine a clear preference for all participants, *mixed* if some participants showed a clear preference (but one or more did not), and *negative* if no preference was established for any participants. Articles were categorized by the topic of the choice variable as "Treatment strategies," "Work tasks," and "Communication." Articles in the tables are listed chronologically under each category.

Table 1.

Categories/ Studies	**N**	**Participants Age range Diagnoses**	**Independent Variable of Preference assessment (Preference Comparisons)**	**Type of Assessment**	**Dependent Variable of Preference Assessment (response definition)**	**Assessment Results**
Treatment strategies						
Hanley, Piazza, Fisher, & Maglieri, (2005)	2	5yrs; 8 yrs MR+ AU+ seizure disorder; MR+ ADD+ ODD	FCT or FCT + Punishment	Concurrent	Percent of time allocated to divided room	Positive
Fisher et al., (2005)	2	Age, 13, 14 autism & severe MR; chromosomal ab & autism	treatment type R+ or R- in FCT	Paired choice	destructive behavior & communication responses	Mixed
Dozier et al., (2007)	2	6yrs ;14yrs AU; MMR	Treatment or Baseline (no treatment) no control condition but did control for therapists and sides of the room	Concurrent	Percent of time allocated to divided room	Positive
Harding, et al., (2009)	2	4yrs MMR; MMR	Treatment type Demand +FCT vs. alone	Concurrent	Selection of side of room	Positive
Leaf, Sheldon, & Sherman (2010)	3	Age: 3-5 yrs Disability: Autism	Prompting System No-No prompting vs. Simultaneous	Concurrent	Selecting a colored mat that represented the prompting system	Mixed
Geiger et al., (2010)	3	Age: 7-9 yrs AU	modeling type video vs. in vivo modeling	Concurrent	Participants chose between two colored cards and then a third was introduced as a control	Negative

Table 1 (continued)

Brower-Breitwieser et al., 20	3	ages 16, 10, 6, diagnoses AU	ABA vs. TEACCH	Concurrent	Choosing a red or blue square representing treatment types	Negative
Giles, St. Peter, Pence, & Gibson (2012)	3	Age 10, 6, 8 Down syndrome Williams syndrome cerebral palsy	treatment type redirection vs. response blocking	Concurrent	Touching a colored paper that represented either redirection or response blocking	Positive
Communication						
Winborn et al., (2009)	2	2yrs 6mo; 2 yrs 5 mo. DD + Seizures	Novel vs. existing mands	Concurrent	Use of mands	Positive
Canella-Malone, DeBar, & Sigafoos (2009)	1	11 yrs mitochondrial disorder;	AAC devices: Picture exchange vs. Mini-Message Mate vs. Cyrano Communicator	Choice Arrangement	Choosing one of the three devices from the array and using it appropriately	Positive
Sigafoos, et al., (2009)	1	15 yrs old Down syndrome and AU	Picture Exchange vs. Speech Generating Device	Choice arrangement	Choosing one of the modes and using it appropriately	
Winborn et al.,(2009)	2	7yrs; 20 yrs PDD+ seizure MR	Microswitch vs. picture card	Concurrent	Pressing the microswitch or touching the card	Positive
Son, Sigafoos, O'Reilly & Lancioni (2006)	3	5 yrs 5mo; 3 yrs 8 mo.; 3yrs AU; AU; PDD	Picture exchange vs. VOCA	Choice Arrangement	Selection of one of the two devices	Positive
Falcomata, Ringdahl, Christensen, Boelter (2010)	1	Age 34 Diagnoses Autism + MMR	Microswitch activation, picture touch, vocal request	Concurrent	Switch press, picture touch, vocalization	Positive

Table 1 (continued)

Padilla et al., 2011	2	5 yrs; 6 yrs Spinal muscular atrophy + PDD; AU+Mild ID	Language of reinforcement Spanish or English play; no control	Concurrent	Microswitch presses	Negative
Van der Meer et al., 2012	4	Age: 5-10yrs ASD, Multi-System Developmental Disorder, Down Syndrome +ASD Congenital Myotonic Dystrophy	Proloquo2Go ™ vs. Manual Signing	Choice Arrangement	Pointing to touching or picking up selected communication option	Positive
Van der Meer et al., 2012	4	4-11 yrs AU global developmental delay; Au; Au =m ID AU +ID	Proloquo2Go ™ vs. Manual Signing vs. Picture Exchange	Choice Arrangement without replacement	Touching/holding, and/or manipulating the device	Positive
Work Tasks						
Lattimore, Parsons, & Reid (2003)	5	AU + severe or profound MR	Job tasks	Multiple stimulus	Selection of pictures representing Job tasks	Mixed
Spevack, Hiebert, Yu, Martin (2004)	4	Ages 23-25 AU	Choice of tasks	Paired choice	Selection of pictures representing Job tasks	
Reid, Parsons, Towery, Lattimore, Green, & Brackett (2007)	3	ages 29-76 Severe to profound cognitive disabilities	Various Work tasks	Multiple stimulus and paired	Selection of materials representing work tasks	Mixed

Table 1 (continued)

Smeltzer, Graff, Ahearn & Libby (2009)	3	6-8 yrs old PDD-NOS; AU; Fragile X	Student selected task choice vs. teacher selected task choice	Concurrent	Selection of board representing student vs. teacher or verbally state	Positive
Horrocks & Morgan (2009)	3	CP moderate ID	Job tasks	Video-based and multiple stimulus	Selection of thumbs up thumbs down for video based: Selection of pictures for multiple stimulus	Positive
Morgan & Horrocks (2011)	3	18-19 DS, Williams Syndrome, ID	Job tasks	Video based preference assessment	Selection of thumbs up thumbs down following each video	Positive

Note: abbreviations used: AU= autism, MR= mental retardation, ADD= attention deficit disorder, ODD= oppositional defiant disorder, FCT= functional communication training, ab= abnormality, R+= positive reinforcement, R-= negative reinforcement, MMR- mild mental retardation, ABA= applied behavior analysis, DD= developmental disability, AAC= augmentative and alternative communication, PDD= pervasive developmental disorder, VOCA= voice output communication aid, ID= intellectual disability, ASD= autism spectrum disorder, PDD-NOS= pervasive developmental disorder not otherwise specified, CP= cerebral palsy.

Participants

A total of 61 participants were included across the 23 studies. Participants ranged in age from 2.5 years old to 76 years old. There were a variety of diagnoses for the participants with many participants who had multiple diagnoses. Most commonly, participants had diagnoses of intellectual disability ranging from mild/moderate to severe/profound and autism spectrum disorders.

Preference comparisons

Preference comparisons included evaluations of treatment strategies, communication types, and work tasks. Studies separated into each category are described below. For each category, two studies are described with a general summary of the overall study and a description of the preference assessment utilized within the study.

Treatment strategies

Studies in this category evaluated preferences for different treatment strategies. Eight studies fell into this category (Brower-Breitwieser et al., 2008; Dozier et al., 2007; Fisher et al., 2005; Geiger et al., 2010; Giles, St. Peter, Pence, & Gibson, 2012; Hanley, Piazza, Fisher, & Maglieri, 2005; Harding, et al., 2009; Leaf, Sheldon, & Sherman 2010). Preference comparison variables in this category included treatment vs. no treatment, prompting strategies, positive and negative reinforcement, FCT with and without punishment, video modeling, redirection, and response blocking. Examples of treatment versus no treatment and no-no prompt versus simultaneous prompt are reviewed here.

Dozier et al., (2007) evaluated whether participants would prefer treatment conditions or no treatment conditions (i.e., baseline). Two children, ages 6 years old and 14 years old, with diagnoses of moderate AU and MR respectively, participated in the study. First, a functional analysis was done to determine the functions of challenging behavior. Treatment packages were then created and the efficacy of the treatments was evaluated to determine if the treatments decreased challenging behaviors. For one participant the final treatment package consisted of Environmental Enrichment plus Functional Communication Training. In this treatment package the participant learned to give a picture card to a therapist which resulted in continuous access to preferred stimuli. For the second participant the treatment package consisted of Functional Communication Training plus Blocking. The participant was taught to use picture cards to gain access to preferred stimuli for 30 seconds and any instance of self-injurious behaviors was blocked.

In the preference evaluation, the researchers utilized a concurrent choice design to determine participants' preferences for treatment or no treatment conditions. The researchers divided the therapy room in two using tape. They then assigned one side of the room and one therapist as the treatment condition and the other side of the room with a second therapist as the no treatment condition. Participants were exposed to each side of the room prior to preference trials in order to expose them to the different contingencies. The conditions associated with the sides of the room changed from session to session to control for preference for a particular side of the room. Additionally, therapists were switched after eight sessions to control for preference for the therapist. The researchers collected data on the amount of time allocated to each side of the room. Both participants allocated the majority of their time to the treatment side. This remained true even after therapists were switched to control for a bias for therapist, indicating they may have had a preference for the treatment and not the therapist. The preference for the treatment side of the room remained even after a two month follow up.

Leaf, Sheldon, & Sherman (2010) compared preference for two types of prompting systems in instruction: no-no prompting and simultaneous prompting. The study included three children with autism between the ages of 3 and 5 years old. The overall study evaluated the effectiveness of No-No prompting procedures and simultaneous prompting procedure using a parallel treatments design. Children were taught pairs of target skills, one using no-no prompting and the other with simultaneous prompting. No-No prompting consisted of the delivery of a "no" in a neutral tone when a child provided incorrect responses followed by a remedial trial for the child to respond. If

the child still provided an incorrect response a second “no” was delivered followed by a controlling prompt. The simultaneous prompting conditions consisted of a prompt immediately following each instruction which prevented errors from occurring. All three children reached mastery with no-no prompting but did not reach full acquisition with simultaneous prompting.

A concurrent chains design was utilized as the preference evaluation to determine the participants’ preferences for the prompting strategies. Different colored mats were used during teaching and probe sessions to pair each condition with a particular color. Three colors were used to represent one of three conditions, daily full probe sessions (blue mat), no-no prompting (red mat), and simultaneous prompting (yellow mat). During daily full probe sessions, the child’s target skill was probed to determine progress towards mastery. No prompting procedures were used during the probes. During no-no prompting, the red mat was utilized to represent the condition and the no-no prompting procedures were in place. The yellow mat represented the condition where the simultaneous prompting procedures were in place. The mats were utilized for the entirety of the study so that the children could discriminate between the conditions. After every third session participants were allowed to choose which condition they would start with for the sessions. The yellow and red mats were placed in front of the child the child was asked to choose the mat the wanted to work with first. Whichever mat the child chose indicated the prompting procedure that would be initiated first. If the child made no decision, the investigators randomly chose which condition to start. The preferences for treatments were mixed. One child chose no-no prompting 11 times and simultaneous prompting 2 times. This suggested the child had a preference for the no-no prompting procedures. Another child chose no-no prompting 6 times, simultaneous prompting 2

times, and made no choice 4 times. Authors hypothesized that she either had no preference or failed to discriminate between the conditions. Finally, one child chose no-no prompting twice and simultaneous prompting eight times, indicating he had a preference for simultaneous prompting. Authors noted that some limitations to the procedures were that there was no preference for color assessment conducted and that there was no control color mat to help ensure the children were discriminating between the conditions.

Communication

Communication studies evaluated participants preferences for modalities (various augmentative and alternative communication devices (AAC)), types of mands (e.g., novel versus known), or language (e.g., English versus Spanish). Nine studies fell into this category (Canella-Malone, DeBar, & Sigafoos, 2009; Falcomata, Ringdahl, Christensen, Boelter, 2010; Padilla et al., 2011; Sigafoos, et al., 2009; Son, Sigafoos, O'Reilly, & Lancioni 2006; Winborn et al., 2009; Van der Meer et al 2012a; Van der Meer et al., 2012b, Winborn et al., 2002). Examples of preferences for modalities and language are reviewed here.

Van der Meer, Sutherland, O'Reilly, Lancioni, and Sigafoos (2012), evaluated children's acquisition and preference for three AAC modes including, picture exchange, manual signing, and speech-generated devices. Children in the study ranged in age from 4 to 11 years old. All children were diagnosed with ASD and had very limited communication skills. This study utilized parents and a teaching assistant to provide the instruction to the children for each of the AAC devices. The children were taught to mand using each mode of communication successively. For example, once a child was taught to criterion to use picture exchange, the child was then taught to criterion to use a

speech-generated device, and then taught to use manual signing. Data was collected on each child's acquisition and correct responding for each communication mode. All four children acquired skills to use at least one of the AAC modes.

Preference for the AAC modes was evaluated in baseline, intervention, post-intervention, and follow up phases to determine if preference could be established early on and if preference was consistent across time. A choice arrangement method was used. During baseline, the AAC modes were placed on the table and their use was modeled and explained by a trainer. The children were then asked to choose which device they would like to use. These procedures were also utilized in intervention, post-intervention, and follow up conditions, with the addition of a requesting opportunity using the selected device. All participants demonstrated an overall preference for one device.

Padilla et al., (2011) compared the effectiveness of functional communication training (FCT) in English and in Spanish for two children who came from Spanish speaking homes and received English instruction in school. Functional Analysis protocols were done to determine the function of challenging behaviors for the children in English and Spanish prior to the start of the study. The behaviors were maintained by attention, and FCT interventions were created to address the attention function in both English and Spanish. The study used a multi-element design embedded in a reversal design to compare the effectiveness of the Spanish FCT intervention to the English FCT intervention. The children's mothers were taught to use the FCT interventions and the sessions were conducted in the children's homes with the mothers implementing the intervention. Researchers found that both Spanish and English FCT were equally effective for decreasing destructive behavior for both children.

A concurrent schedules design was used as preference assessment to determine if the children had a preference for either the language used during the play portions of the

FCT intervention. Once children had completed the tasks associated with the FCT demands, they were shown two microswitch buttons and asked " Do you want to jugar o play in English?" Both buttons showed identical pictures of a child playing. One button had the word "Jugar" and the voice output stated "A jugar por favor" and represented a condition where the child could play and the child's mother would provide comments in Spanish. The other button had the word "Play" on it and the voice output recording stated "Play please". In this condition the child played with the toys and the mother provided comments in English. Children made their selection by pressing one of the microswitch buttons and the corresponding play session would begin. Results for both children showed no strong preference for English or Spanish play conditions. Both children pressed the buttons at 50% each indicating they may have had no preference or that they may not have understood the differences between the conditions.

Work tasks

Studies that evaluated participants' preferences for job types or choice within work tasks are included in this category. Six studies fell into this category (Horrocks & Morgan, 2009; Lattimore, Parsons, & Reid, 2003; Reid, Parsons, Towery, Lattimore, Green, & Brackett, 2007; Morgan & Horrocks, 2011; Smeltzer, Graff, Ahearn, & Libby 2009; Spevack, Hiebert, Yu, Martin 2004). Examples of preferences for job type and choice versus no choice (student versus teacher choice) are reviewed here.

Smeltzer et al., (2009) compared the effects of providing choice within activities to having teachers choose task activities. Three students with developmental disabilities (pdd-nos, AU, and Fragile X) participated in the study. Researchers used multiple stimulus without replacement preference assessments to determine least preferred tasks for the children. Two different colored scheduled boards were used to represent

conditions, one (red) for teacher's choice and one (green) for student's choice. In the teacher's choice condition, the therapist chose the order of the tasks where in the second condition the student controlled the order of the task. A yoked condition was also in place to control for the order of the task the student chose vs. teacher. In this task the teacher chose the order, but the order of activities was identical to previous student chosen orders. Data was taken on students' time on task, challenging behaviors during task, and duration to complete the task. For all three students, an increase in time on task, decreased duration to complete the task and decrease in challenging behaviors occurred during student choice conditions.

A concurrent operant design was used to determine if the participants preferred student vs. teacher choice conditions. During these preference assessments both boards (red and green) were presented and the participant was told, "you can choose the order of your tasks or I can choose it for you." The participant indicated his choice by physically touching a board or verbally stating which condition he preferred. The condition corresponding to the board then began. Both participants chose the student selected tasks conditions 100% of the time indicating a strong preference for being able to have control of their schedules.

Morgan and Horrocks (2011) evaluated the use of a video-based preference assessment for determining high and low preference jobs for three adults with cognitive disabilities. Participants were given a choice of which job they would prefer to do via two picture cards representing the jobs for the day. A video-based assessment was utilized to determine the high and low preferred jobs for the participants. Participants were shown icons on a computer screen representing types of job tasks. They were asked to select the icons they preferred and the computer then made suggestions for jobs based off the selection of tasks that related to the preferred icons. Participants then watched videos of

the possible jobs. They were asked to select a “thumbs up” or “thumbs down” indicating their preference for the job. Jobs were then presented side-by-side to determine a hierarchy for most and least preferred jobs. On a separate day, the same procedures were utilized to identify a low preferred job. During this assessment participants were asked to choose jobs they would not like to do. After identification of preferences, participants were observed performing the highest and lowest preferred jobs and data was collected on the individuals’ on-task performance. Additionally, a third condition evaluated participant’s choice vs. no choice. Job performance on choice days was compared to no choice days. Results showed that the video-based assessment was successful in identifying high and low preferred jobs for all three participants. Furthermore, data indicated students had higher on-task behaviors in high preferred job conditions and choice conditions as compared to low preferred and no choice conditions. Overall, the study supported the use of the video-based assessment in identifying high and low preferred jobs for all three participants.

Assessment results

Methodologies for assessing preference in these studies included paired stimulus (N=3), multiple stimulus assessment (N=2), concurrent operants (N=11), and choice arrangement (N=7). In the majority of studies, a clear preference was determined (N = 16). Four studies yielded mixed results; some participants demonstrated a preference, while others did not. Three studies were designated as negative; none of the assessments yielded a difference in choice responding among treatment variables for any participants.

Discussion

Overall, these studies demonstrate that researchers are assessing preference in several ways with a variety of methodologies and utilizing a variety of variables for

evaluation. The studies reviewed present several good rationale for including preference evaluation for treatment variables. These include their use for providing clients with more input into their treatments, thereby enhancing self-determination. The client's input on treatment options also provides another form of social validity measures for the treatments used in the field. Some considerations for improving the methodologies need to be refined by research. Finally, several factors that could influence preference need to be considered and future research can help add to the growing literature in this area.

Implications for Practice

Rationales for the use of preference assessments for treatment variables include increasing the opportunity for self-determination and providing an additional measure of social validity for the treatment. Wolf's (1978) original description of social validity focused on the use of subjective judgments regarding the acceptability and perceived benefits of behavioral interventions. The use of social validity measures to understand how others feel about treatment packages is commonly directed towards families (whether they think it is successful). Preference assessment can be used as a social validity measure directed at the individual and is a more objective measure for assessing client's preferences. This could be one way of providing a voice to these individuals who are often unable to fully communicate on their own.

Clients input could prove to be invaluable to improving treatments for individuals with DD. Dozier provides a very convincing argument for the use of client input in treatment:

> […] a typically developing] child with an infection is usually 'forced' to take an antibiotic. However, if a child shows resistance or discomfort in receiving a

particular treatment, adjustments are usually made (e.g., a different antibiotic is used, a pleasing flavor is added to the medication, etc.). Similarly, nonpreferred behavioral interventions conceivably could be modified such that they become preferred […] If a given individual tends to prefer time spent in baseline to treatment (i.e., increased time spent participating in treatment) […] there are several possible ways to enhance treatment that would not interfere with the efficacy of treatment, such as increased reinforcement density or magnitude in treatment conditions, or increased delay to reinforcement during baseline conditions"(p159).

In cases where practitioners are evaluating ways to enhance the palatability of treatment, preference assessment may help guide us towards what the client may actually prefer and may help to increase the client's engagement in treatment.

Refining Methodologies

As we consider the increased use of preference assessments for treatment variables, we also need to make improvements to the methodologies in order to improve our ability to assess individuals' true preference. The concurrent chains methodology was utilized for the majority of preference evaluations. It may be necessary to further refine this methodology in order to provide a consistent methodology for practitioners to employ. Some areas to consider are control conditions and other extraneous variables.

Of the 11 studies utilizing the concurrent chains methods only 1 study utilized a control condition, though this was not part of the initial assessment. The control condition was

added when no clear preference was established with only two choice cards. Most studies presented choice as only 2 conditions. This may be a limitation in that it may not be clear if individuals are actually displaying a preference or are choosing a button randomly. For example in vivo modeling was compared to video modeling. Video modeling was paired with one color card and in vivo modeling with another. The individuals were allowed to choose a color card. If children showed a split preference a control card was introduced. This however did not help to establish a clear preference. It may have been a limitation that the control card was added later rather than from the start to establish if the children were discriminating between the conditions.

The reviewed studies used a variety of ways for individuals to express their preferences such as selecting a side of the room, colored button, or therapist which represented specific conditions. When examining preference, it is imperative that other extraneous variables are controlled for. Failing to do so can lead to confounding results. Researchers should consider preferences for variables that may bias an individuals' selection of the dependent variable. For example in Sigafoos et al., (2009), researchers noted that the participant was allocating responses to the AAC device that was closest to him. Modifications then had to be made to ensure devices appeared equally in left to right and far and near placements. Leaf, Sheldon, and Sherman (2010) suggested that researchers may consider conducting a color preference assessment when using various colored switches as the dependent variable. Individuals have been shown to display preference for therapists or at least behave differently (e.g., challenging

behaviors) with different people. Therefore, this may be another area that should be controlled for when determining true preference in individuals with disabilities.

Factors influencing preference

Another factor to consider is the participants change in preference over time. Participants did not always choose one variable exclusively. In Giles et al., (2012) two participants' initial choices differed at the beginning of assessments but had changed by the end of assessments. It may be necessary to conduct preference assessments at various points in intervention to determine if clients' preferences change. If they do change, it may be necessary to reevaluate what factors or modifications can be made to help maintain engagement in treatment.

Another factor that may contribute to a client's preference is response effort. Studies on functional communication training have shown that students engage more often in low-effort mands as opposed to high-effort mands (Horner & Day, 1991). Richman, Wacker, and Winborn (2001) found that a low-effort response of signing "please" was utilized more than a high-effort response of aggression. This allocation of responses to lower effort behaviors was also replicated for a child who was being taught to use a Picture Exchange System (Buckley & Newchok, 2004). Preference assessments may be useful to determine when response effort may be affecting engagement in skill acquisition or how this may contribute to challenging behaviors during skill acquisition. For example, language of instruction may play a role in the effort required for children to acquire skills. For children who are English language learners, instruction in English

means that learning new skills requires more effort as they are learning not only the skill, but also the language associated with that skill. Instruction in the child's native language may have a lower response effort for this population. If children show a lower rate of acquisition in their nondominant language (L2), this might mean that L2 requires higher response effort. This may be especially important for children with developmental disabilities, as acquiring language is already a difficult task. Preference assessments may help provide a way for the children to indicate a preference for language of instruction.

Future research

The studies reviewed provide support for the use of preference assessments to evaluate preference for treatment variables. Future research should consider the application of these assessments to evaluate additional variables in treatments such as language of instruction. The focus of the studies presented in this dissertation is to extend research on preference to language of instruction in children who come from Spanish speaking homes. The two studies presented will evaluate whether preferences assessments can be utilized to determine a preference for language of instruction and whether the difficulty of tasks affects preference for language. Chapter 3 will provide the methodology for the two studies.

Chapter 3

Method

The purpose of this chapter is to describe the methodology for the two studies. The first study evaluates whether a concurrent operant procedure could be used to assess preference for language of instruction. The second study then evaluates the effects of difficulty of instruction on the preference for language of instruction. For both studies, a description of the participants, the materials used, and the setting in which the study took place are provided. Definitions of the dependent and independent variables, measurement, interobserver agreement, and fidelity are also included.

Study 1.

Participant

The participant was referred for the study through a local school district. The participant was referred by teachers who were aware of clients who were from Spanish-speaking homes and had DD. Figure 1 depicts a language exposure profile which was used to illustrate the amount of each language the participant was exposed to by people in his home environment and school instruction. This information was gathered from interviews with the home caregiver and a review of the child's IEP to determine what languages were used for instruction. For the school setting, only the instructional portion

was included for the language exposure table. It was not possible to determine exact language exposure at school due to a number of volunteers and aides who worked with the child, but were not consistently present at school.

Alejandro was 6 years old at the time of the study. He was independently diagnosed with autism and was categorized in the severely autistic range on the Childhood Autism Rating Scale (CARS: Schloper, Reichler, & DeVellis, 1980). He was non-verbal, but did make some imitative sounds such as "Ba" for "bye" but this was not consistent. Interviews with the parents indicated that the dominant language spoken in his home was Spanish. His mother only spoke Spanish and his father spoke some English but only spoke Spanish in the home. At school, Alejandro was enrolled in an English-only class with no bilingual support. Figure 1 displays the language exposure for Alejandro for his home and school setting. His typical class day was from 7:30 am to 2:30 pm. His placement was a segregated classroom for students with ASD. There were six students in his classroom, and instructors included his teacher and two aids. According to Alejandro's classroom teacher he had not yet mastered any receptive targets without the use of prompts. The target skill chosen for Alejandro was receptive identification of body parts paired with a model prompt. The project was conducted in a separate classroom that was not occupied during the assigned project time. The preferred item used for Alejandro was a Batman action figure.

	Only Spanish	Mostly Spanish	Both equally	Mostly English	Only English
Mother	■				
Father		■			
School Instruction					■

Figure 1. Language exposure for Alejandro at home and school.

Assessment Implementer

All sessions were conducted by the same implementer who was a BCBA level instructor trained and experienced in working with children using ABA techniques. The implementer was bilingual in English and Spanish. Having one implementer controlled for a possible bias for a preferred teacher instead of a preferred language.

Target skills

Target skills were goals chosen from the child's Individualized Education Program (IEP). The goals chosen had to have a language component, so targeted skills were receptive language skills.

Setting

The participant and therapist sat side by side in chairs at a long table. Materials were placed in front of the child.

A session consisted of 10 trials (choices), and the percentage chosen for each switch was graphed.

Materials

Three colored (blue, green, and yellow) Big Mac switches were used to represent English instruction, Spanish instruction, and a control (no language, demand, or attention). The switches were programmed to say "work in English," "trabajo en Español," or had no auditory recording.

The preferred reinforcer was identified using an MSWO with no verbal instruction (i.e., items were simply laid out and the child was allowed to take an item from the array).

Measurement

Design

A modified concurrent-operant design was used to evaluate children's preference for English versus Spanish instruction. In a concurrent-operant methodology, two or more reinforcement contingencies are available simultaneously, and allocations of responses in either option are evaluated (Kennedy, 2005). This study utilized switch pressing as the initial links, these led to two possibilities, those links that ended with reinforcement in the form of access to preferred items, or a link that ended in no reinforcement. Additionally, the two links that ended in reinforcement had equal tasks with only language of instruction changed. Figure 2 shows the links for Alejandro's concurrent operants.

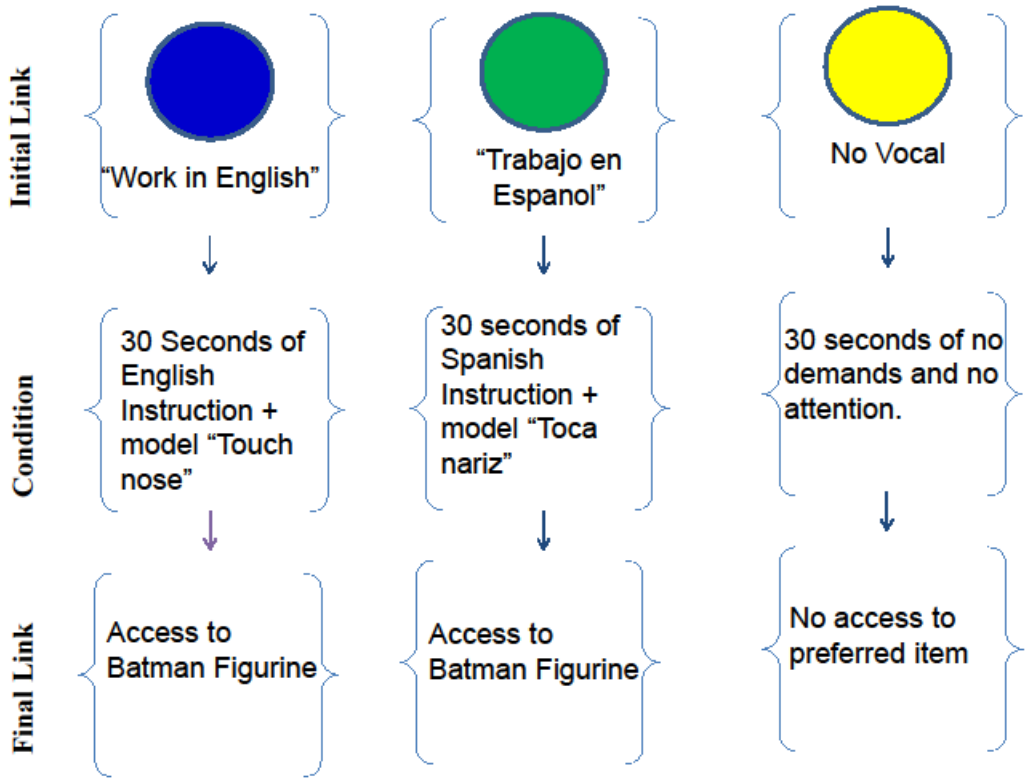

Figure 2 . Concurrent chains for Alejandro.

Independent Variable

The independent variable for the study was the language of instruction associated with each condition. These were English instruction, Spanish instruction, and no instruction (control). When the English switch was pressed, 10 imitation demands in English (e.g., "touch nose," "touch eyes,") were presented followed by a reinforcement period. The Spanish chain was identical to the English chain except all instructor verbalizations were in Spanish (e.g., "Toque nariz," "Toque ojos,"). Scripts for instruction were matched by word when possible and were made to be exact replications

of instructions in each language. One switch served as a control to show that the child discriminated between chains that received reinforcement and those that did not. The control chain initiated a period of no demands, no attention, and no access to the reinforcer.

Dependent Variable

The dependent variable in the study was the choice (depression of microswitch) made by participants from among the options for language of instruction.

Data Collection

Data was taken on the frequency of switch presses during each session. A switch press was defined as a physical depression of one of the colored switches. If two were pressed at the same time, no score was recorded; instead, the participant was taken back to a neutral position, both hands by the child's sides, and the trial was started over. Frequencies of press switches for each option were converted to percentage of trials for each session for the purpose of data analysis.

Interobserver Agreement

Interobserver agreement data was collected by a second independent observer who was trained in assessment procedures and data collection. This observer was present for 35% of sessions with IOA sessions spread through the entire duration of the study.

The second observer was a graduate student who was trained on the concurrent chains procedures and had completed four semesters of college-level Spanish. The

observer was also a BCBA level ABA instructor with experience working with children who have DD.

IOA was calculated using a trial-by-trial agreement calculation (Cooper, Heron, & Heward, 2007). Each of the observers' responses was compared trial-by-trial for agreement with the first data collector. IOA was calculated using the following formula:

$$\frac{\text{Number of trials (items) agreement}}{\text{Total number of trials}} \times 100$$

Treatment Fidelity

Treatment fidelity was assessed for 35% of sessions. A treatment fidelity checklist for both English and Spanish was used to ensure that the same script was used in each language. An example of the treatment fidelity checklist can be seen in the Appendix A.

Treatment fidelity was assessed using a second observer, who checked off whether the trainer (a) followed the correct steps for presenting and rotating the microswitches (b) provided correct instruction in the chosen language, and (c) provided social approval statements in similar tones across languages. The checklist included instructions for exposure trials, pre-choice trials, choice trials, and instruction. Treatment fidelity was calculated by dividing the total number of steps done correctly by the total number of steps possible and multiplying by 100%.

Procedure

Exposure trials

During this phase the child was exposed to each of the conditions represented by the switches. The three microswitches were placed in a horizontal arrangement in front of the child. The therapist stood behind the child and physically prompted the child to press a switch. The corresponding chain was then initiated. The order of microswitch exposures was randomized, and the positions of the microswitches were changed with each trial to counterbalance preference for position. A total of 30 exposure trials were conducted, which were broken down into three sessions of 10 trials each. This allowed the child to be exposed to each chain a total of 10 times.

Choice trials

This portion was the preference evaluation, as the child was allowed to choose which chain to initiate independently. Prior to each choice session one exposure trial for each chain was conducted to remind the child of the contingencies of each chain. A choice session consisted of 10 trials

During choice sessions microswitches were placed in front of the child, as in the exposure trials, but the child was no longer physically prompted to press a microswitch. If the child did not make a choice on his own within 3 seconds, a gestural prompt (sweeping motion from left to right and back) was used to indicate to the child to choose a switch. No verbal prompts were used. Once the child pressed a switch, the chain associated with the switch was started.

Reprogramming

After the 10th session, switches were reprogrammed to prevent a bias for a specific color (i.e., the colors of the switches were reassigned). Exposure procedures and choice procedures were then rerun to see if the preference for language remained.

Study 2

Study 2 utilizes the preference assessment procedures developed in Study 1 and further examines the effects of difficulty of task on the preference for language of instruction.

Participants

Participants were referred for the study either through local county services or through a local school district. Participants were from Spanish-speaking homes and had a DD. Students' placements in schools also varied, with some children enrolled in English-only classes, some in Spanish-only classes, and some in bilingual education programs, which varied in the percentages of English and Spanish instruction times. Table 2 provides a description of participants including their age, CARS rating, the setting where the study took place, and the instructional targets used for the study. Figure 3 provides the language exposure charts for each participant.

Table 2. Participant descriptions and target skills

Participant	**Age; CARS**	**Setting**	**Instructional Targets**
Gloria	10 yrs old; Severely Autistic	Home	Expressive Number Identification What number is it?; Que numero es? Easy: 1-100 Difficult: 200-1000
Diego	6 yrs old; Severely Autistic	Home	Expressive Number Identification What number is it?; Que numero es? Easy: 1-10 Difficult: 50-100
Marisol	5 yrs old; Severely Autistic	Home	Expressive Letter Identification What letter?; Que letra? Easy: A-G Difficult F-Z
Rico	8 yrs old; Moderately Autistic	School	Expressive Counting Money How much?: Cuanto es? Easy: Same coin types up to $1.00 Difficult: Mixed coin types up to $2.00
Luis	5 yrs old; Severely Autistic	School	Receptive Identification of Alphabet Touch__: Toca__ Easy: Letter A Difficult: Letter O

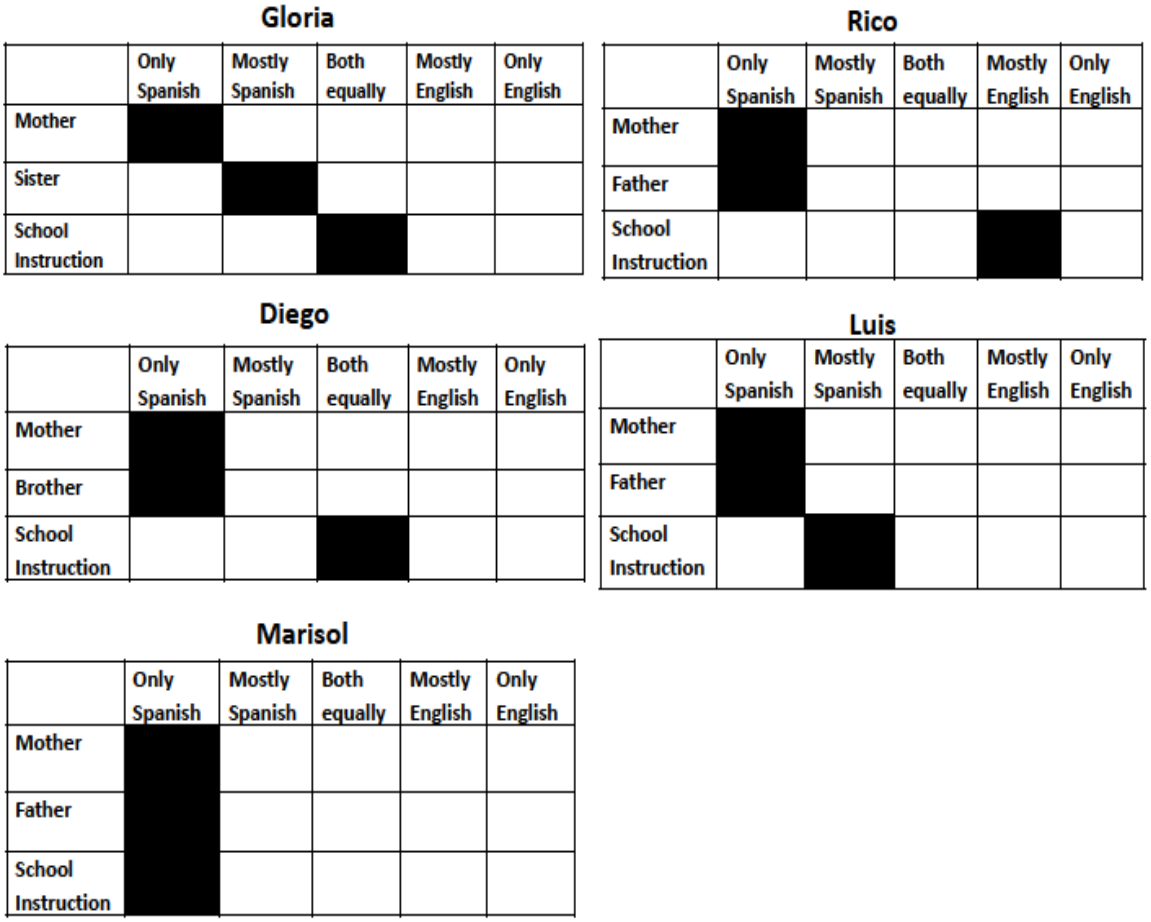

Figure 3. Language exposure tables for Study 2 participants

Gloria was a 10-year-old girl with a diagnosis of ASD and ID. Her score on the CARS was in the "severely autistic" range. She was verbal with a mean length of utterance of 3 according to her IEP and independent school speech evaluations. She lived at home with her mother who spoke only Spanish and her 8-year-old sister who spoke mostly Spanish but was enrolled in English as a Second Language (ESL) at school.

Gloria was enrolled in bilingual SPED and according to her IEP received instruction in English and in Spanish. It was not clear what amount of instruction was delivered in each language, but the teacher reported they aimed for 50/50 during instructional times. She attended school five days per week from 7:30-3:30 and was in a segregated classroom for students with ASD with a teacher: student ratio of 2:6. She was seen at home for the study. Her instruction was conducted in her bedroom with her bed set up as her work area. Chairs were brought in so that the therapist and student could sit side-by-side. Her preferred item was a movie. A portable DVD player was used to show her 30-second clips of her preferred movie during reinforcement access times. Her task demands were expressive number identification which was taken directly from her school IEP. The SD was "What number is it?" in English and "Que numero es?" in Spanish. Her instructional target was expressive number identification. Her easy tasks were expressively identifying numbers 1-100. Her difficult task was expressive identification of numbers 200-1000. Numbers were chosen at random via a random number generator program. Numbers were written on 3X5 index cards and shuffled at the beginning of each session.

Diego was a 6-year-old boy with a diagnosis of ASD and ID. His score on the CARS was within the severely autistic range. He had some language but typically spoke in only one word utterances. He lived at home with his mother who spoke only Spanish and his 3-year-old brother who also spoke only Spanish. At school, he was enrolled in Bilingual SPED and according to his IEP received instruction in both English and Spanish. The amount of instruction he received in each language was not clear from his

IEP, but according to his teacher they aimed at 50/50 instruction. He attended school five days per week from 7:30am to 3:30 pm. He was in a segregated classroom for students with ASD with six students, a teacher, and two aides. His preferred item was a movie. A portable DVD player was used to show him 30 second clips of the movie during reinforcer access. The instructional target taken from his IEP was expressive identification of numbers. Diego's easy task was expressive identification of numbers 1-10 and his difficult task was expressive identification of numbers 50-100. The SD in English was "What number is it?" and in Spanish was "Que numero es?" Numbers were written on 3X5 index cards and shuffled at the beginning of each session.

Marisol was five years old with a diagnosis of autism. Her score on the CARS was within the severely autistic range. She could verbally request a limited number of items in English and could echo words in English and Spanish. She lived at home with her mother and father who both only spoke Spanish. At the time of the study she was enrolled in a Spanish-only preschool classroom for six months, but had been in an English-only preschool classroom for the entire school year prior. She was seen at home for the study. Marisol was only seen through her 13th choice session due to scheduling conflicts and the family's relocation to another city. Her instructional skill was expressive identification of numbers. Her easy task consisted of expressive identification of numbers 1-5. Her difficult task was expressive identification of numbers 10-15. Numbers were written on 3X5 index cards and shuffled at the beginning of each session.

Rico was an 8-year-old boy diagnosed with ASD. His score on the CARS was within the mild to moderately autistic range. He was verbal and spoke in sentences in

both English and Spanish. He lived at home with his mother and father who both spoke only Spanish. He had only lived in the country for one year and lived in Mexico prior to moving to Texas. In Mexico he received only Spanish instruction. In Texas he was enrolled in Bilingual SPED. According to his teacher he received about two thirds of his instruction in English and one third in Spanish. He was seen at school for the study. His preferred item was access to the Ipad. Sessions took place in the hall outside his classroom where he typically received one-on-one instruction. His target was expressively counting money, which was taken from his IEP. His easy tasks consisted of counting up to 1.00 with all like coins (e.g., all dimes). His difficult task was counting up to 2.00 with mixed coins. He was given varying amounts of money according to easy or difficult task requirements and asked "How much?" during English instruction or "Cuanto es?" during Spanish instruction. The amount of money given changed with each trial.

Luis was a five- year-old boy with a diagnosis of autism and intellectual disability. He had a CARS rating of severely autistic. He was considered non-verbal, but was reported to occasionally repeat words, but this was not consistent. He lived at home with his father and mother who both spoke only Spanish. He had been enrolled in school for one year in a bilingual classroom, but his teacher reported that they spoke only Spanish when speaking directly to him, though he was exposed to English when instruction was mixed for the rest of the classroom. His setting was at school in the hall outside of his classroom where he typically received one-on-one instruction. His preferred item was access to the Ipad. His target skill was receptive identification of

alphabet letters. His easy skill was receptive identification of "A" and his difficult task was receptive identification of "O" within a field of three with 2 other distractor letters that were not the letter A

Setting

If the child was participating in the project through school, the setting was a separate classroom with no other children present. The participant and therapist sat side by side in chairs at a long table. Materials were placed in front of the child.

If the child was participating in the project in the home setting, the project was conducted in an area of the home that was isolated from people (typically, the child's bedroom). When possible, a desk and two chairs were used, to have a setup similar to the classroom settings. If no desk was available, the bed was used as a desk, and two chairs were brought in so that the therapist and child could sit side by side in front of the bed.

A session consisted of 10 trials (choices), and the percentage chosen for each switch was graphed. No more than three sessions were conducted per day.

Materials

Materials used for the preference assessments were identical to those used in Study 1 (three colored microswitches). Other materials needed were items directly related to the task the children were required to complete or their specific preferred reinforcers.

Measurement

Design

Study 2 utilized a combined concurrent chains embedded within an ABAB design. The concurrent chains were the preference assessment procedures describe in Study 1. In the ABAB design, easy tasks were used during the A phase and difficult tasks were used during the B phase, for Diego, Gloria, and Marisol. This was reversed with A phases consisting of difficult tasks and B phases consisting of easy tasks for Luis and Rico. This was done to counterbalance the possibility of a phase order bias.

Independent Variable

The independent variable in Study 2 was the difficulty of the task used during the preference assessment, which was either "easy" or "difficult." Easy skills were mastered tasks that the child was able to do correctly in 100% of trials in both languages**.** Three probes in each language confirmed that the child was able to do the task. A difficult task was defined as a nonmastered goal in the child's educational plan, one that the child could not yet do beyond 50% accuracy without prompting in both languages. Three probes in each language confirmed that child was unable to do the task.

Dependent Variable

The dependent variable in the study was the preference for language of instruction as demonstrated by choice of microswitch symbolizing the language chain.

Data Collection

Data was collected on the frequency of switch presses. A switch press was defined as a physical depression of one of the colored switches. The percentage of switch presses for each color was calculated for each session.

Interobserver Agreement

As in Study 1, interobserver agreement data was collected by a second independent observer who was trained in assessment procedures and data collection. The same observer from Study 1 watched videos of 35% of sessions for all participants, but Marisol. Videos were randomly selected from each phase.

For Marisol a different IOA observer was used because Marisol's parents did not consent to videotaping. The observer was a graduate student who was trained on the concurrent chains procedures and was a native Spanish speaker. He was a Master's student who had received training in ABA procedures and was currently completing experience requirements for BCBA certification.

A trial-by-trial IOA was calculated (Cooper, Heron, &Heward, 2007) according to the following formula:

$$\frac{\text{Number of trials (items) agreement}}{\text{Total number of trials}} \times 100$$

Treatment fidelity

Treatment fidelity was assessed for 35% of sessions, 7 out of 20 sessions, for each participant. A treatment fidelity checklist for both English and Spanish was used, as in Study 1, to ensure that the same script was used in each language. Scripts were matched by syllable when possible and were made to be exact replications of either easy or

difficult instructions. Treatment fidelity was calculated by dividing the total number of steps done correctly by the total number of steps possible and multiplying by 100%.

Procedure

Preference assessment procedures from Study 1 were utilized in both the easy (A) and the difficult (B) phases. The participant went through exposure and choice trials as described in Study 1. At the start of each new phase, the participant went through exposure trials again for 10 trials, so that he or she would be exposed to the new instruction. Reprogramming occurred at the 10th session at which point a full set of 30 exposure trials (3 sessions of 10) were done to pair the new chains.

Chapter 4

Results

Study 1

Visual analysis of the graphed data allows us to see the separation of the data paths, which indicates differentiated allocation of responses. Differentiation in allocation between English or Spanish and Control indicates the participant's discrimination between chains (i.e., the control switch does not lead to a chain that provides reinforcement). Differentiation in allocation between English and Spanish indicates the participant's preference for one chain over the other.

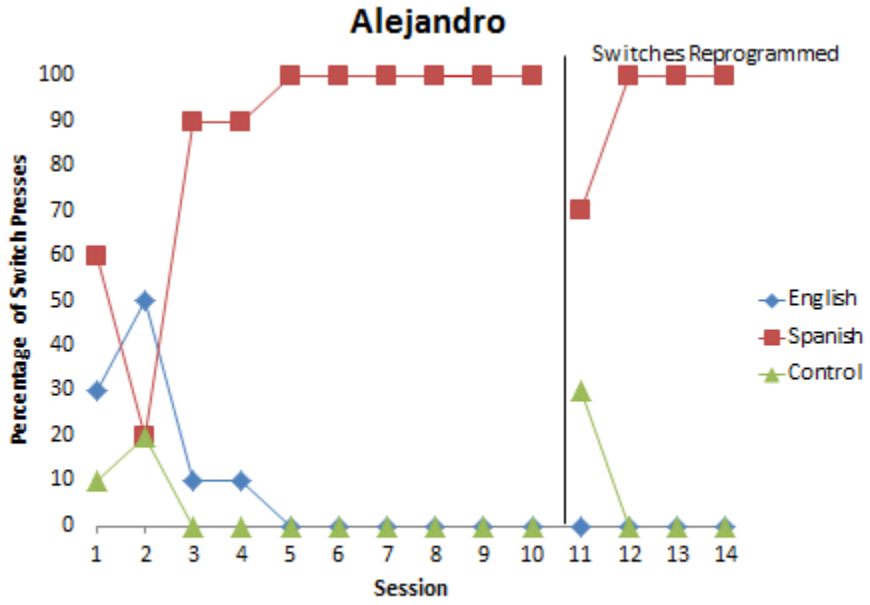

Figure 4. Alejandro preference results

Figure 4 displays Alejandro's preference results. Visual analysis of Alejandro's data indicated that, overall, he allocated an average of 87.9% of his choice responses towards Spanish instruction, 7.1% towards English instruction, and 2.1% towards the control condition. He allocated more choice responses towards Spanish instruction after his third session. He showed exclusive allocations to Spanish instruction after his fifth session. Following the tenth session, switches were reprogrammed as indicated by the event line. Then, after the 12th session, Alejandro again showed exclusive allocations of choice responses to Spanish instruction.

Study 2

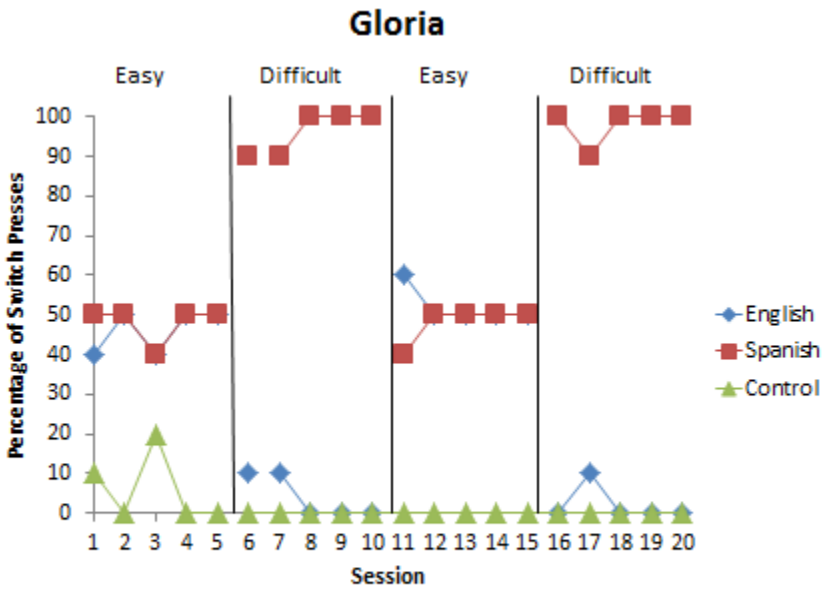

Figure 5. Gloria Preference Results

For Gloria, A phases consisted of easy tasks and B phases consisted of difficult tasks. Figure 5 displays the results of Gloria's preference assessments. During her first A phase, Gloria's allocations of choice responses were: 48% for Spanish instruction, 46% for English instruction, and 6% for control conditions. Gloria showed little differentiation in allocations of choice responses between English and Spanish instruction.

When difficult tasks were implemented in the first B phase, Gloria's allocations were: 96% for Spanish instruction, 4% for English instruction, and 0% for control conditions. Gloria allocated the majority of choice responses to Spanish instruction.

A return to phase A (easy tasks) Gloria again showed little differentiation in allocations of choice responses between English and Spanish instruction. Gloria's allocations of choice responses during the second A phase were: 48% for Spanish instruction, 52% for English instruction, and 0% for control condition.

A return to phase B (difficult tasks) Gloria again allocated the majority of choice responses to Spanish instructions. Gloria's allocations of choice responses during the second B phase were: 98% for Spanish instruction, 2% for English instruction, and 0% for control.

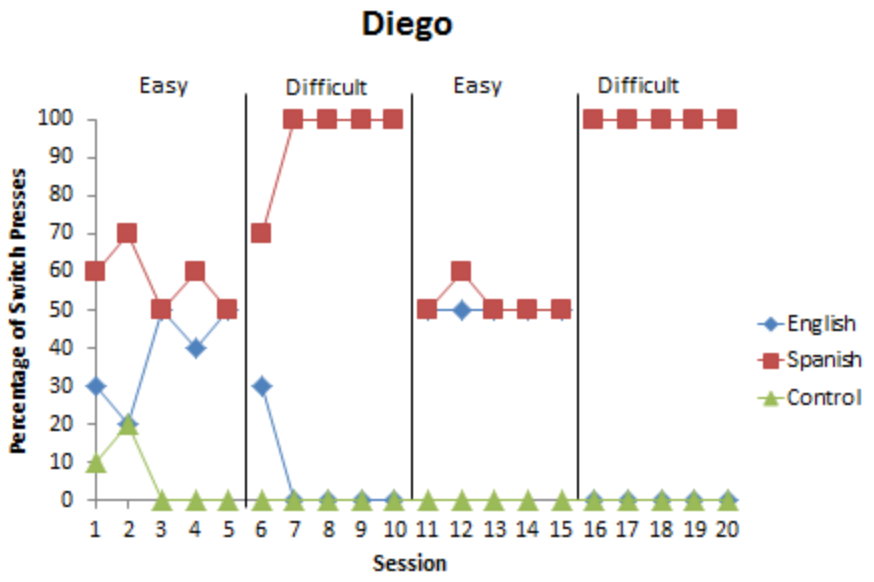

Figure 6. Diego Preference Results

For Diego, A phases consisted of easy tasks and B phases consisted of difficult tasks. Figure 6 displays the results of Diego's preference assessments. During his first A phase, Diego's allocations of choice responses were: 58% for Spanish instruction, 38% for English instruction, and 4% for control conditions. Diego showed little differentiation in allocations of choice responses between English and Spanish instruction.

When difficult tasks were implemented in the first B phase, Diego's allocations were: 94% for Spanish instruction, 6% for English instruction, and 0% for control conditions. Diego allocated the majority of choice responses to Spanish instruction.

A return to phase A (easy tasks) Diego again showed little differentiation in allocations of choice responses between English and Spanish instruction. Diego's

allocations of choice responses during the second A phase were: 52% for Spanish instruction, 48% for English instruction, and 0% for control condition.

A return to phase B (difficult tasks) Diego allocated the all of his choice responses (100%) to Spanish instructions.

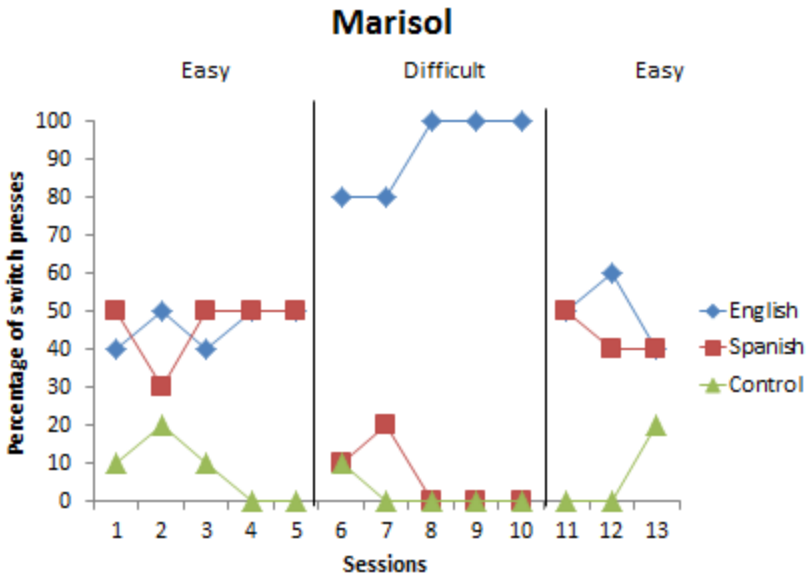

Figure 7. Marisol Preference Results

For Marisol, A phases consisted of easy tasks and B phases consisted of difficult tasks. Figure 7 displays the results of Marisol's preference assessments. During her first A phase, Marisol's allocations of choice responses were: 46% for Spanish instruction, 46% for English instruction, and 8% for control conditions. There was little

differentiation between English and Spanish instruction, but there was clear differentiation between allocations to the control condition versus instruction conditions.

When difficult tasks were implemented in the first B phase, Marisol's allocations were: 6% for Spanish instruction, 92% for English instruction, and 20% for control conditions. The majority of allocations during this phase were towards English instruction.

In a return to phase A (easy tasks) Marisol again showed little differentiation in allocations of choice responses between English and Spanish conditions, but clear differentiations between instructional conditions and the control condition. Marisol's allocations of choice responses during the second A phase were: 43.3% for Spanish instruction, 50% for English instruction, and 6% for control condition.

There was not a return to B phase for this participant due to participant dropping from the study due to relocation.

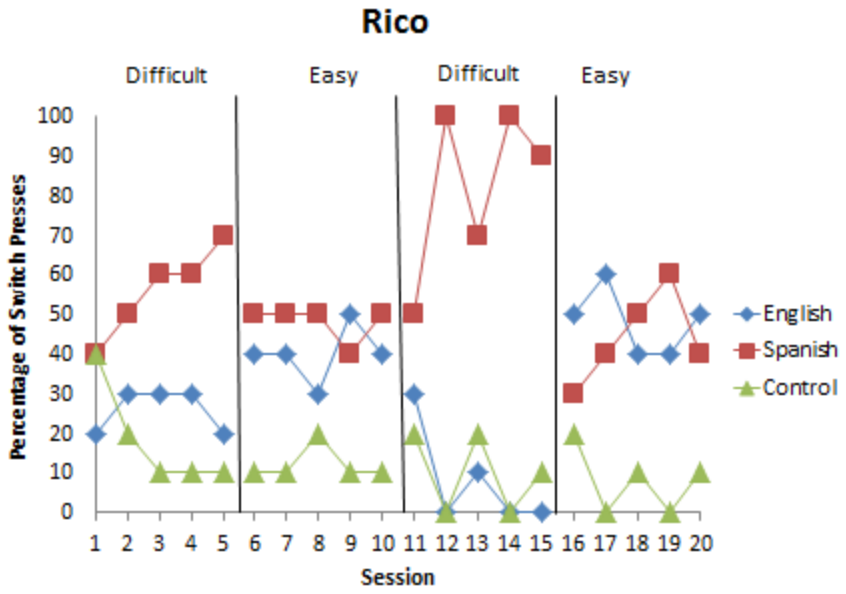

Figure 8. Rico Preference Results

For Rico, A phases consisted of difficult tasks and B phases consisted of easy tasks. Figure 8 shows the results of the preference assessments for Rico. During his first A phase, Rico's average allocations of choice responses were: 56% for Spanish instruction, 28% for English instruction, and 16% for control conditions. Rico's allocations towards Spanish instruction trended upwards as sessions continued with the largest differentiation between responses on the fifth session.

When easy tasks were implemented in the first B phase, Rico's allocations were: 48% for Spanish instruction, 40% for English instruction, and 12% for control conditions. Allocations for Spanish vs. English responses were within 10% of each other with clear differentiations between control conditions.

In a return to phase A (difficult tasks) Rico again showed larger differentiation in allocations of choice responses between English and Spanish instruction. Rico's allocations of choice responses during the second A phase were: 80% for Spanish instruction, 10% for English instruction and 10% for control condition.

In a return to phase B (easy tasks) Rico again showed nearly equal allocations between Spanish and English instruction. Rico's allocations of choice responses during the second B phase were: 44% for Spanish instruction, 48% for English instruction, and 8% for control.

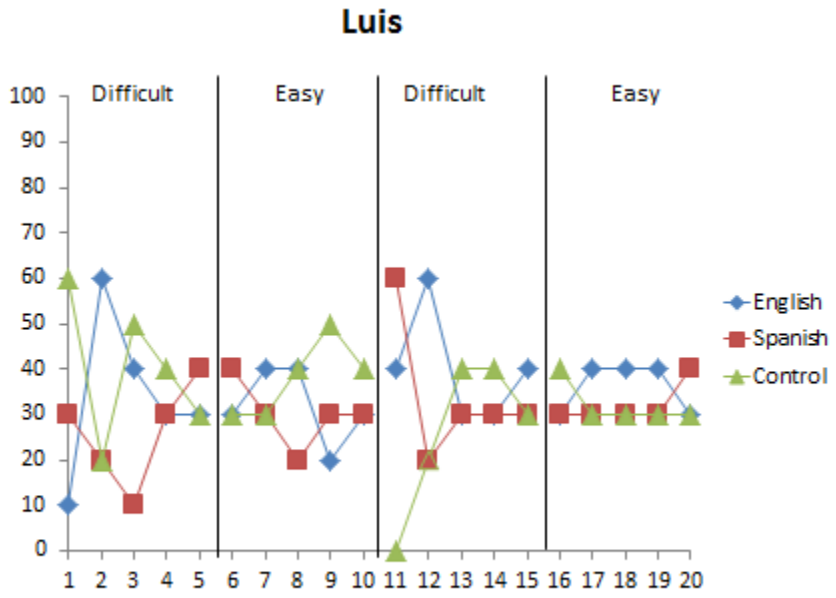

Figure 9. Luis Preference Results

For Luis, A phases consisted of difficult tasks and B phases consisted of easy tasks. Figure 9 displays the results of Luis's preference assessments. During his first A

phase, Luis's allocations of choice responses were: 26% for Spanish instruction, 34% for English instruction, and 40% for control conditions. There were no consistent differentiations between Spanish, English or control conditions.

When easy tasks were implemented in the first B phase, Luis's allocations were: 30% for Spanish instruction, 32% for English instruction, and 38% for control conditions. Again, no consistent differentiations emerged between the three conditions.

In a return to phase A (difficult tasks) Luis again showed little differentiation in allocations of choice responses between English, Spanish, and control conditions. Luis's allocations of choice responses during the second A phase were: 34% for Spanish instruction, 32% for English instruction and 38% for control condition.

In a return to phase B (easy tasks) Luis again showed nearly equal allocations between Spanish, English instruction and the control condition. Luis's allocations of choice responses during the second B phase were: 32% for Spanish instruction, 36% for English instruction, and 32% for control.

Interobserver Agreement and Treatment Fidelity Results

Table 3 displays the average IOA and treatment fidelity for all participants. Interobserver agreement calculations for all participants were 100%. Treatment fidelity ranged from 95%- 100% with averages of 100% for Diego, Rico, and Luis. Alejandro had an average treatment fidelity score of 90% with a range of 80% to 100%. Gloria and Marisol both had averages of 95% with a range of 80%- 100%.

Participant	**Interobserver Agreement Average Range**	**Treatment Fidelity Average**
Alejandro	100%	94%
Gloria	100%	100
Diego	100%	100
Marisol	100%	94%
Rico	100%	100
Luis	100%	100

Table 3. Interobserver agreement and treatment fidelity results

Chapter 5

Discussion

In this final chapter, the results of both studies are interpreted with respect to the research questions presented for this dissertation. First, can preference assessments be used to determine a preference for language of instruction in children with DD who come from Spanish-speaking homes? Second, do children with DD change their preference for language of instruction when they are given difficult tasks versus easy tasks? Six children with developmental disabilities who came from Spanish speaking homes were recruited for participation in the studies. A concurrent chains preference assessment was utilized to determine if the children showed a preference for one of three conditions: a Spanish instruction condition followed by a preferred reinforcer, an English instruction condition followed by a preferred reinforcer, or a no-instruction condition followed by no reinforcer access. Different colored Big Mac switches were used to represent each of the conditions and to serve as the initial links within the concurrent chains. The children were exposed to each of the three conditions in a series of exposure trials and then preference sessions were conducted to evaluate the children's choice of conditions. The second study also evaluated the manipulation of task difficulty which consisted of the use of mastered tasks (easy) in one phase and non-mastered (difficult) task in the second phase. This discussion will evaluate factors that contribute to preference assessments, the complexities of students who are both ELL and have DD, implications for practice, and directions for future research.

Preference Results

For the first study, the question of whether a concurrent chains methodology could be used to assess preference for language was determined by the use of the switches to represent language of instruction. Alejandro showed clear preferences with the use of this preference methodology. He chose Spanish instruction nearly exclusively for 12 out of 14 sessions. The control condition was chosen minimally, indicating he was able to discriminate between the chain conditions. His preference for Spanish instruction remained even after color switches were reprogrammed to control for a possible color preference. These results were especially surprising considering that the task he was being asked to do, while it necessarily included verbal language, did not require he understand or use the language to complete the task; he was being asked to follow receptive language instructions to identify body parts, but was given an imitative model. Alejandro could have completed this task without attending to the language (just following the imitative model), yet he consistently chose to be instructed in Spanish. Additionally, Alejandro's results were contrary to what Alejandro's teacher hypothesized his preference would be. His teacher had predicted Alejandro would choose English instruction, since Alejandro was taught exclusively in English at school.

The second study sought to extend the first study by evaluating the effects of task difficulty on student's preference for language. Five participants were given the preference assessments with difficult tasks and easy tasks. Easy tasks were defined as mastered targets the children demonstrated for three probes each in English and in Spanish. Difficult tasks were the same skill as the easy, but were levels of the target the

children had not yet mastered beyond 50% in either language. When the tasks were easy, Gloria, Diego, Rico, and Marisol appeared to have no strong preferences between languages of instruction. They chose both English and Spanish conditions nearly equally. The control condition was not chosen often, indicating the students were differentiating between the links that concluded in reinforcement and the control link that did not conclude in reinforcement. However, preferences changed when the tasks were difficult; response allocations shifted almost exclusively towards one language. Gloria, Diego, and Rico showed preferences for Spanish instruction during difficult tasks, with Gloria and Diego choosing Spanish instruction almost exclusively. Marisol allocated her choices towards English instruction when tasks were difficult.

Unlike Gloria, Diego, Rico, and Marisol, Luis did not differentiate allocation of responses between any conditions. While this indicates that Luis did not demonstrate a preference, it does not mean that Luis did not have a preference for language of instruction. There are several factors that may have affected Luis' responding during this preference assessment.

Factors Affecting Preference Assessments

This next section will discuss factors that may have affected the allocation of responding during preference assessments. Lack of differentiation in allocation could indicate that the participant did not have a preference. However, there are several factors that can affect an individual's responding in preference assessment. These factors can also explain this lack of differentiation. There are several factors that may influence the

results of the concurrent chains preference assessment. These include the prerequisite skills necessary for the use of the preference assessment, the saliency of the chains in the assessments, and exposure trials methods used to teach the chains.

Not all participants showed a clear preference using the concurrent chains procedure. Luis had undifferentiated results across all phases. He chose all conditions including the control condition nearly equally. One reason for this may be a lack of prerequisite skills required for the assessment to provide valid results. It may be possible Luis did not understand the assessment procedure, because he lacked the ability to recognize the buttons as discriminative stimuli leading to different outcomes. He could not make a choice using buttons to represent desired versus undesired consequences. His trial by trial data showed he rotated his choices in a routine fashion during sessions. He would choose each color in sequence. While he made these choices, he did not always appear to be happy with the condition chosen. He often whined or attempted to press other buttons during control conditions. Luis did not seem to understand that he could choose the condition according to his preference rather than maintain a sequenced routine.

Another factor that may affect a preference assessment is the saliency of the chains. Improving the saliency of the stimuli that represent the various outcomes may help an individual discriminate between the chains, thus improving the validity of the assessment. This could be done by increasing the exposure trials, having visual supports for the switches, or perhaps bringing the child to different areas of the room for each chain. For example, having pictures (a visual support) on the buttons may have been

more salient than the colored buttons. The association between a picture and an outcome may be clearer than the association between a color and an outcome.

The exposure trials procedure was another factor that could have affected the preference assessment. Exposure trials were used to allow the participants to experience each of the chains thus associating the buttons with the outcomes. Exposure trials were to help participants understand what each switch represented. It is not clear that the exposure trials alone were enough for each child to understand the distinction between the chains. Many of the children did not show clear differentiations of preference until after their third sessions. This suggests that the children were still learning the chains during the first three sessions. It is possible that while they were learning to press the buttons during the exposure trials, they were not actually attending to the chains associated with the switch colors and the condition it would start. This may be because the children were prompted through each condition. It was not until they were independently pushing the switches that they seemed to understand the chains.

Luis' results suggest that the concurrent chains assessment may not be the most appropriate assessment for all students. Research on preference indicates that when choosing an assessment, considerations about the child's abilities need to be taken into account (Kang et al, 2012). For example, an MSWO would not be used for a child who is not yet able to scan arrays. Instead, a single stimulus or paired stimulus preference assessment might be used. Future research may consider what prerequisite skills would be necessary, how to increase saliency, and improvements to teaching the concurrent chains procedures to students.

Implications for Practice

The information gleaned from this study leads us to several practical implications for the education of ELLs with DD. Language of instruction affects a student's abilities to generalize skills and use language in a natural context. Resources need to be made available in order to support the decisions of families and students. Finally, professionals need to be educated about the complexities and best practices for students from Spanish speaking homes with DD.

Individuals with autism and DD have difficulty with communication, and 50% are likely to never exhibit functional verbal abilities (Rueter, 1977). Generalization, use of skills in different contexts or use of different skills for similar outcomes, is also difficult. As educators work to improve their communication it is imperative we consider the communication that is necessary in their everyday environments, which should include their family and home settings. For example, Marisol had been taught to request for items in English when she attended an English only preschool program. However, since Marisol's mother spoke only Spanish, this skill was no longer functional at home because Marisol's mother did not know what Marisol was requesting. For some requests, Marisol's mother reprimanded her because she had confused the request with foul language. Marisol's mother reported that her daughter must have picked up foul language from school. A bilingual therapist, not from the school, then clarified the request that Marisol was making was not foul language but a mand for "peach." This example provides some interesting points to consider. First, Marisol was generalizing her

requests from school to home. This is something that is usually a positive and sought after result, however, since the language was not understood by her mother the behavior was punished. This example reverberates the need for professionals to work closely with families and for instruction to have a contextual fit not only in the school environment, but also the home environment. Marisol's case highlights considerations that must be made by professionals and families with regards to language placement and instruction.

Another consideration for ELLs with DDs is the availability of resources. The lack of resources makes it difficult to make appropriate placement decisions that fit the complex needs of Spanish speaking families who have children with DD. For example, Marisol was enrolled in English only instruction for the first year she attended school. This enrollment choice was not her mother's preference, but her mother stated she allowed her to be enrolled in the classroom because the only Spanish instruction classroom was located miles away from where the family lived. While the school would provide transportation for the child, her mother worried she would not be able to get to her school in the case of an emergency, as she did not have access to a vehicle. This was not a best practice recommendation for her educational programming, but a necessary decision for practical purposes. After a year and a half of schooling in English, Marisol's mother chose to enroll her in the Spanish instruction class, as she was no longer able to communicate with her daughter. At the time of the study, Marisol had been enrolled in Spanish instruction for six months. Overall, this case highlights the difficulties of providing appropriate evidence based practice due to lack of available resources. Not

only is it important to assay the preferences of families and students, it is also essential to provide resources to support those decisions.

In addition to the need for more available resources, professionals should also be trained in the complexities of providing appropriate education to children with DD who do not speak English. According to Mueller, Singer, and Carranza, a majority of educators of non-English spelling students with DD have no professional training in working with this growing population. Many educators' beliefs do not align with the best practices for a student whose primary language is not English. Only 9% of educators working with this population believed that the child's primary language should be taught. These beliefs reflect practices within the classroom. The vast majority of these educators used English for expressive and receptive language instruction. These beliefs and practices contradict an educational program that is appropriate for students and their families. Only when professionals are trained in the complexities of the intersection between developmental disabilities and families who do not speak the dominant language, can we begin to adequately serve this growing population.

Directions for Future Research

There are several avenues for future research in the area of preference assessments and in working with ELLs. First, the preference studies should be replicated and extended. Replication research could help validate the assessment with other age groups and disability categories. Additionally, extensions on the research could help to improve the methodology to create systematic assessments for professional use. Future

research should also consider the implementation of these assessments with teachers and determine the best ways to feasibly assess preferences in the classroom. There is also much broader research on the area of ELLS with DD that should be considered. Research is needed in assessment and instruction of ELLs and in working with families and professionals. There are several growing bodies of research in this area and continued research and is needed to provide best practice recommendations for this bourgeoning population.

First, research can continue to examine the role of language of implementation and its effects on skill acquisition and other factors influencing learning which can include challenging behavior, maintenance of skills, and generalization to environments beyond the classroom. Previous research has examined the role of language in assessing challenging behavior and found that rates of challenging behavior were higher in English functional analysis than in Spanish functional analysis for a young child who came from a Spanish speaking home (Rispoli et al., 2011). More research is needed to understand the effects of the language of implementation in assessing challenging behaviors particularly for those children who are part of bilingual environments.

Research is also needed to determine how to best assess language levels accurately in this population. Although the recommendations are to determine the levels of language ability in both languages, assessments for that purpose are limited, particularly for students who are nonverbal (Toppleberg et al., 1999). While some studies have utilized language assessments, such as the Peabody Picture Vocabulary, these assessments were originally created to assess English-speaking children, and the

validity of their use with ELL students is limited (Dunn & Dunn, 1981). Research on the assessment and instruction of students with DD who are ELLs should include instruments that are unbiased and can measure the child's knowledge in each language. This becomes even more complex when assessing language in individuals who may be non-verbal. Future research may consider comparing current language assessment tools in the native and non-native languages for individuals with DD.

Additionally, research in the area of instruction is needed to determine best practices for acquiring skills for ELL students with DD. Again, the role of language of instructions may be crucial to understand in this area. Previous research has had mixed results with regards to which language is best for instruction and the effects of bilingual environments on cognitive and language skills. Whitikar et al., (1985) showed benefits for high-language-proficient bilinguals with MR but not for low-language-proficient students with MR. On the other hand, Bird et al., (2005) did not see a detrimental effect for students who were bilingual, but neither were benefits apparent. Most recently, Ohashi et al., (2012) found no statistically significant differences on the language abilities of young children with ASD who were in monolingual environments versus those in bilingual environments. Continued research is needed to further assess the impacts of bilingual environments and skill acquisition. Future research should consider what language should be taught to students with DD whose native language is not English. Furthermore, what levels of mastery are necessary in the native language before a second language should be introduced? Do these children benefit from bilingual education, or should they remain in native language instruction? Lastly, for those students who are

able to learn a second language, how should the second language be introduced and taught?

Finally, research focusing on professional practices and working with families is also needed to provide culturally sensitive treatment in the field. Toppleberg et al., (1999) recommended having trained professionals who can implement intensive interventions for students in both the native and the second language. There is a high demand for special education teachers who are bilingual and shortages of these professionals exist across the nation (Mclesky, Tyler, and Flippin, 2004). Research on the education and training of professionals working with students who are ELLs should ask the following questions: What are the essential skills that professionals need to provide quality education for students who are ELLs with DD? How can teacher preparation programs provide these skills? Finally, what other resources do teachers working with students who are ELLs with DD require? Toppleberg et al., (1999) also recommended including families in the decision-making process when considering what language to use for instruction. While the recommendation to include families in the decision-making process is echoed throughout the articles, it should be noted that more than half of the respondents in the Mueller et al., (2006) study indicated that parents were not a part of the language-of-instruction decision. Therefore, an important question for future research is how to incorporate families into the educational process. Also, to what extent do families wish to be involved in the educational process? Does family involvement impact assessment and instruction outcomes for the child? Finally, how do

we build relationships with families to be able to include them in critical decision making regarding instruction of their child?

In summary, this dissertation sought to extend the research on preference assessments to include language of instruction as a treatment variable. The studies found that children who come from Spanish speaking homes have preferences for language of instruction particularly when instruction gets difficult. Continued research is needed to help improve the methodology for assessing preferences. Additionally several lines of research are needed to guide how to best support the education of ELLs with DD.

Appendix

Exposure Trials Procedures	**Correct**	**Incorrect**	**N/A**
1. Place three microswitches on table in front of child in horizontal arrangement.			
2. Therapist physically prompts the child to press the switch labeled.			
3. Give child "demands" for 30 s in corresponding language.			
4. Script is followed for corresponding language			
5. For no language condition: child sits in chair (for 30 s); block attempts to escape; no R+ .			
6. After 30 s the child can have reinforcer for 10 s.			
7. After 10 trials the child is given at least a 5-min break.			
8. Process is repeated until each color of microswitch has been presented 10 times (30 trials total) N/A only did Session 2 for re-exposure.			

Instruction Procedures	**Correct**	**Incorrect**	**N/A**
1. Therapist provides instruction for 30 s in corresponding language. a. SDs are presented approximately every 3 s. >			
2. SD is presented with model. If child does not imitate the model within 3 s, then the therapist physically prompts the child to do so. <u>SDs English</u> <u>SDs Spanish</u> "Touch head" "Toca cabeza"			

"Touch eyes" "Toca ojos" "Touch nose" "Toca nariz" "Touch legs" "Toca piernas" "Touch mouth" "Toca boca"			
3. After child engages in target behavior, therapist says, "Good job"/"Muy bien."			
Choice Procedures – Presession Choice	**Correct**	**Incorrect**	**N/A**
1. Place three microswitches on table in front of child.			
2. Therapist will physically prompt the child to press a switch.			
3. Give child "demands" for 30 s in corresponding language.			
4. Script is followed for corresponding language.			
5. For no language condition: Child sits in chair (for 30 s); block attempts to escape; no R+.			
6. Therapist repeats the procedure so that each microswitch is pressed once and the contingencies for that switch are followed through on.			
Choice Procedures – Choice	**Correct**	**Incorrect**	**N/A**
1. Place three microswitches on table in front of child.			
2. Allow child 10 s for child to press switch.			
3. Give child "demands" for 30 s in corresponding language.			
4. Script is followed for corresponding language.			
5. For no language condition: Child sits in chair (for 30 s); block attempts to escape; no R+.			

6. Process is repeated for 10 trials.			
7. Child is given at least a 5-min break between sessions.			

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